

Relational Contracts and Courts

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Abstract

Using a special dataset on a sample of small and medium enterprises in India, we investigate the effectiveness of informal relationships relative to courts in both *ex ante* prevention and *ex post* settlement of business disputes. We find that availability of informal channels for dispute prevention, such as intervention by a social or business contact, does not help contract enforcement in an environment with an ineffective legal system but fairly developed market institutions. We also find that, following a contract violation, relationships are used widely as a substitute for legal mechanisms, including courts, to settle the dispute, especially by the smaller and younger firms. The findings indicate that, even though informal channels are not effective in preventing contract violations, seeking redress through them following a violation entails less transactions costs than through an ineffective legal system. Our analysis of *ex ante* and *ex post* incentives of the firms to settle business disputes without courts is a unique feature of this study.

Keywords: Legal institutions, courts, informal relationships, markets, trade credit

JEL Classifications: G0, K0, O5

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I. Introduction

Relational contracting between firms is a noticeably common feature of business activities in many societies. A number of studies have documented such relationships at work in different countries, including East and South Asia, Eastern Europe, Sub-Saharan Africa, and many other emerging economies, in different forms (networks of various types), and in different kinds of commercial transactions. The inter-firm relational contracts that are most common, and have received the most attention in the academic literature, involve trade credit transactions between firms (See, for example, McMillan and Woodruff, 1999a and 1999b; Bigsten *et al*, 2000; Johnson, McMillan and Woodruff, 2002; Biggs and Shah, 2006; Allen *et al*, 2005, 2009).

In economies where courts function, what is the role of relational contracting? A wealth of empirical and theoretical literature indicates that in such economies inter-firm relationships supplement the courts in facilitating business contracting (see Macaulay, 1963; Galanter, 1981; Baker, Gibbons, and Murphy, 1994; Grief, 1997, and Mann, 1998). Conversely, when relational contracting is effective, what do courts add? Johnson *et al* (2002) address this question in an insightful study on the relative importance of courts and relational contracts in five post-Soviet East European countries. They find that confidence in the legal system helps new relationships to start and develop, though court effectiveness is largely irrelevant to the functioning of established relationships.

In the present paper on the role of courts vis-à-vis relational contracts based on the experience of a sample of small and medium enterprises (SMEs) in India, we ask parallel questions. When courts are ineffective, can relational contracting be effective and, if so, under what conditions? Intuitively, relational contracts run the risk of breaking down when the commercial legal system functions poorly but at the same time, as in India, the market institutions are fairly developed. In this situation, search cost of locating alternative partners is limited, and the repeated-game incentives to continue the current relationships are weak (Kranton, 1996; Ramey and Watson, 1996; McMillan and Woodruff, 1999a). Our empirical findings confirm this intuition.

In this paper, we investigate the effectiveness of informal relationships relative to courts in both *ex ante* prevention and *ex post* settlement of contract violations. Does the availability of informal channels, such as intervention by a social or business contact, help deter contract

violations? We find evidence to the contrary, consistent with the intuition discussed above. Second, following a contract violation, are relationships used as an effective substitute for legal mechanisms, including courts, to settle the dispute? We find that reliance on relationships to settle business disputes is inversely related to reliance on courts, especially among the smaller and younger firms. The finding indicates substitution of informal channels for legal institutions among the smaller firms in India. A plausible explanation for both findings together is that, even though informal channels are not effective in preventing contract violations, seeking redress through them following a violation entails less transactions costs than through an ineffective legal system. Our analysis of *ex ante* and *ex post* incentives of the firms to settle business disputes without courts is a special feature of this study. Another special feature is that we use direct tests in both types of investigations. For example, we present a direct test where the firms faced with a breach of contract by customers/suppliers had the choice of going to the court or working the informal channels. The direct tests are made possible by our special dataset. We comment on the dataset below. We note that both special features are unique to our study.

In a study on dispute prevention between firms in Vietnam in the eighties, McMillan and Woodruff (1999b) also enquire into the effectiveness of informal relationships to prevent contract violations in the absence of a credible legal system. Their study parallels our first investigation. The authors find that the relational contracts generally worked well when repeated-game incentives were suitably supplemented with other devices, such as acquiring information about the other party through business or social networks. They recognize that their finding is due in part to the poor state of market institutions at the time in Vietnam¹. In this respect our work, by studying a sample of firms in an environment with more developed market institutions, complements theirs. However, our work is different from theirs not only in the prevailing legal and market conditions of the two countries, India and Vietnam, but also in our broader scope as indicated above.

The dataset used in this study combines two sources of data for a sample of non-financial SME's in India: (1) cross-sectional data of trade credit transactions and other financing activities for the year 2005 compiled from their financial statements and (2) the responses of the same firms in a survey of the role of relationships in contract enforcement and other business

¹ “The success of relational contracting might be in part a consequence of another transaction cost, the high cost of searching for alternative trading partners”, McMillan and Woodruff (1999b, p.643)

decisions. The survey was conducted across India in 2006. The cross-sectional data for 2005 was obtained from the *Prowess* database of the *Centre for Monitoring the Indian Economy (CMIE)*². Our strategy to construct a rich dataset by combining survey responses with secondary data on the survey respondents is another special feature of our study. Typically, for information relating to beliefs and perceptions (for example, the importance a given firm attaches to its informal relationships in settling disputes), we rely on the survey data, and for hard financial information (such as the amount of trade credit extended by a firm in year 2005) on *Prowess* cross section data. We believe that this approach enables us to restrict survey data, which typically reflects the respondents' perceptions, to appropriate uses. We have also checked that our final sample is free from non-representativeness and non-randomness biases and several other problems that sometimes bedevil survey-based studies (see the discussion in section III.C below).

The rest of this paper is organized as follows. In section II below, we present some evidence from existing sources on law and institutions in India. In section III, we discuss our data, including the survey responses and the financial data, and the variables that we construct from the data to use in our tests. In section IV, we discuss the methodology, results, and robustness checks of our tests concerning informal relationships and contract enforcement. Finally, in section V, we present our conclusions.

II. Law and Institutions in India

The most striking fact about India's legal system is the difference between superior investor protection *under the law* as opposed to inferior protection *in practice*. Table 1 below compares India's scores along several dimensions of the quality of law and institutions with those of different country groups based on legal origin (La Porta, Lopez-de-Silanes, Shleifer and Vishny (LLSV), 1997, 1998) and several other large emerging economies. The other emerging economies, with the exception of China, is also included in a LLSV country groups based on legal origin (indicated by the letters E, G, and F in the bracket after country name).

² CMIE is a Mumbai-based economic and business information and research organization. Its *Prowess* database provides financial statements, ratio analysis, funds flows, product profiles, returns and risks on the stock markets, etc., of over ten thousand Indian companies. The database has been used in a number of well-known studies (Khanna and Palepu, 2000; Bertrand, Mehta, and Mullainathan, 2002; Gopalan, Nanda, and Seru, 2007).

[Table 1 here]

With its English common-law origin, India has strong investor protection on paper. For example, the scores on both creditor rights (4 on a 0-4 scale in LLSV (1998) based on the Companies Act of 1956 of India (subsequently downgraded to 2 in Djankov, McLiesh and Shleifer, (DMS), 2007), and shareholder rights (5 on a 0-6 scale in Djankov, La Porta, Lopez-de-Silanes and Shleifer (DLS, 2008)) are the highest of any country in the world. Please note from table 1 that, even with a revised score of 2 on creditor's rights, India ranks higher than the average for all the country groups (1.8), as recorded in DMS (2007) as well as the average for the emerging economies included in (1.69).

To assess the efficiency and effectiveness of the legal system for contract enforcement, we use two measures. First, by the legal formalism index (DLS, 2003), a measure of the level of intervention in the country's judicial process on a 0-7 scale whereby a lower score is more desirable, India's index, 3.51, is lower than only the average French-origin country among all country groups. It is also lower than the average for the other emerging economies (4.00). The legality index (Berkowitz, Pistor, and Richard (2003)), a composite measure of the effectiveness of a country's legal institutions, represents the weighted average of five different estimates of the quality of legal institutions and government in the country. The index ranges from 0 to 21, with a higher score indicating a more effective legal system. Again, India's score (11.35) is appreciably lower than the average for each country group. However, India's score is marginally higher than the average for the other emerging economies (10.59).

Since the beginning of liberalization in 1991, two improvements have taken place in the area of creditor rights protection – the establishment of the quasi-legal Debt Recovery Tribunals that have reduced delinquency and consequently improved lending rates (Visaria, 2007) and the passing of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act in 2002 and the subsequent Enforcement of Security Interest and Recovery of Debts Laws (Amendment) Act in 2004. These laws have paved the way for the establishment of Asset Reconstruction Companies and somewhat improved the ability of the banks and financial institutions to act against defaulting borrowers. However, a reliable sample of observations on the effectiveness of the measures is not available.

Corruption is a major systemic problem in many developing countries and is of particular

importance for India. Studies by the World Bank (e.g. World Development Report, 2005) have found that corruption was the number one constraint for firms in South Asia. The two most corrupt public institutions identified by the respondents in India (as well as in most countries in South Asia) were the police and the judiciary. Based on Transparency International's Corruption Perception Index, India had a score of 3.3 on a 0-10 scale in 2006 (a higher score means less corruption), distinctly lower than the average for each country group in Table 1, and even lower than the average for the other emerging economies (3.60).

To summarize, despite strong protection provided by the law, legal protection is considerably weakened in practice by an ineffective legal system and corruption within the government. While the need for judicial and legal reforms has long been recognized, little legislative action has actually taken place so far (Debroy, 2000).

III. Data and Empirical Measures

A. Secondary Data on Firm Characteristics

Our sample includes only SMEs. The official definition of an SME is different for manufacturing and services sectors (Micro, Small and Medium Enterprises Development Act 2006, Government of India). A manufacturing firm that has investments in fixed assets of plant and machinery below Rs. 100 million (US\$ 2.22 million) qualifies as an SME; for firms in the services sector, the ceiling is Rs. 50 million (US\$ 1.11 million) in fixed assets.

Our choice of the sample was driven by two factors. The first factor is our focus on trade credit transactions. The existing studies provide evidence that trade credit is a very important source of financing for Indian SMEs³. Usually, a trade credit transaction occurs directly between the parties concerned, without the intervention of a financial intermediary. The supplier agrees to accept payment from the customer after delivery of the goods. In a relationship-based lending, the supplier depends on its partner firm to uphold the relational contract. This makes the transaction a suitable observation on relational contracting. We note that evidence from

³ For a sample of about 9,000 Indian SME's in Allen, et.al 2009 (table 6), almost 16% of their total funding during 2001-2005 came from trade credit. It was by far the single biggest source. Using financial reports of around 2,000 *public* companies from 1990-91 to 2002-03, the *Reserve Bank of India* (2005) finds that the smaller Indian firms depend heavily on trade credit for their funding needs and much more so than the larger firms. Using balance sheet information for nearly 6,000 Indian firms between 1994-2003, Love and Peria (2004) come to a similar conclusion.

existing studies (e.g. Allen, et.al 2009) also indicates that trade credit deals between small and medium-sized Indian firms are often not backed by legal contracts or even written contracts. Second, SMEs constitute an important segment of the Indian economy, contributing to over 40% of the value added in manufacturing.⁴

Many of the SMEs in India are not organized as business units. The *Prowess* database of CMIE provides information on corporate financing and other firm characteristics of SMEs registered under the Companies Act, 1956. The database includes 2,343 SMEs for which complete financial information is available for 5 years (2001-2005).

B. Survey Responses

Relationships take time to develop. In order to understand the transactions based on informal relationships between the Indian SMEs, we decided to conduct a survey the SMEs that had existed for at least five years at the time of the survey in fall, 2006. The target population comprised the 2,343 firms indentified in the CMIE *Prowess* database. The survey instrument including all the questions was designed by the researchers at Centre for Analytical Finance, Indian School of Business (ISB), Hyderabad, India. Based on a review of survey-based papers in the law and economics literature (e.g. McMillan and Woodruff, 1999a; Johnson *et al*, 2002), we developed the survey questionnaire with special attention to the important issues in the legal and financial environment in which Indian SMEs operate, while trying to avoid biases induced by the questionnaire and maximizing the response rate. The final survey instrument included 99 questions (most with subparts) in three sections. The survey focused on company history, factors affecting company operations, corporate financing practices, relations with banks and financial institutions, informal inter-firm relationships and trade credit transactions, and business and social relationships between the owners/founders of the firms. The tabulated survey responses are available on request.

We did not use the telephonic or the mailed questionnaire method to administer the survey. The nature of our questions dealing with important business and social relationships required us to ensure that the responses came from the owners or top executives of the surveyed

⁴ According to O. S. Kanwar, the President of FICCI, a national chamber of commerce in India. The importance of small and medium private firms is hardly unique to India. High-growth economies are typically marked by a vibrant SME sector. Using a sample of 76 countries (India not included), Beck et al. (2005) find a strong association between the importance of SMEs and GDP per capita growth. However, they are not able to establish that SMEs exert a causal impact on growth or poverty reduction.

units. We also wanted to make sure that the respondents clearly understood the scope of the questions and the purpose of the survey. Consequently, we administered the survey in face-to-face interviews with each of the respondents. The survey was conducted in fall, 2006. We were able to administer the complete survey to 182 firms, achieving a success rate of 8%. After removing the firms that were involved in any kind of financial business, we were left with a final sample of 141 firms.

The sample spans several industries including metal and crude oil extraction, engineering, chemicals, construction, real estate, wholesale and retail trade, and software. Two-thirds of the survey firms were in manufacturing. Firms manufacturing chemicals and chemical products constitute almost 15% of the sample. Construction companies, manufacturers of basic metals and manufacturers of food products & beverages account for 9%, 8% and 7% respectively of the sample firms. As of 2005, (the last year for which financial data is available), the sample firms range in age from 5- years to 129-years, with the median age of 19 years. Only 7 % of them aged less than 10 years⁵. In terms of asset size and sales, samples firms range from \$0.13mn. to \$46.31mn., and zero to \$76.28 mn. respectively. Location wise, the surveyed firms cover almost all regions in India, with a greater concentration in Southern India (almost 41%)⁶. For two-thirds of the firms, the top manager belongs to the founding family. For the larger firms (by the number of employees), this number increases to three-fourths. For most survey firms, the owner is actively involved in day-to-day management. Twenty percent of the surveyed firms reported cases of customer default. Table 2A presents summary of the survey data, and table 2B reports the summary statistics of the firm characteristics, such as assets, sales, trade credit received and extended, taken from the *Prowess* database used in different regression models.

[Table 2A & 2B here]

We have noted above that evidence from existing studies indicates that trade credit is a very important source of financing for the Indian SME's. This is true of our sample firms as well. Trade credit accounted for over 16% of their total sources of funds during 1996-2005, next only to stock financing and bank credit. On the other hand, extension of trade credit was the

⁵ The survey was conducted in late 2006, when financial information was available until 2005.

⁶ Based on Registered office addresses.

second biggest use of their funds over the same period, accounting for as much as a third of the total funds spent⁷.

C. Possible Sample Biases

The survey approach allows the investigators to ask unique project-specific questions, with the possibility of generating important information that cannot be available from secondary sources. However, the approach is not without potential problems that can introduce biases in analysis based on survey responses (see Graham *et al*, 2008). We recognize the problems and address them, as we believe, successfully for the most part.

There are problems inherent in the survey method itself. Survey questions can be misunderstood, or otherwise generate noisy information. Our method of administering the survey in a face-to-face interview with the respondent, offering the respondent an opportunity to seek clarifications if necessary, alleviates the problem. Then, self-reporting of information by the respondent is usually fraught with the risk of under-statement of undesirable traits or characteristics and over-statement of desirable traits. In our particular case, this problem would be minimal, if at all present. The survey questions used in the present study typically avoid all performance-related queries, including particularly financial performance; we use CMIE *Prowess* data for that purpose. Finally, a common, and usually valid, criticism of surveys is that they measure beliefs and perceptions, not actions. In our case, however, it works to our advantage. Typically, for information relating to beliefs and perceptions (for example, the importance a given firm attaches to its informal relationships in settling disputes), we rely on the survey data, while for information relating to financial activities (such as the amount of trade credit received by a firm in a certain year) we use *Prowess* data.

There may be problems in the sample selection criteria also. Our criterion to include non-financial firms that had existed for at least five years at the time of the survey is driven by our intention to include firms that had sufficient time to develop relationships with other firms. Though unavoidable given the objective of our study, the sample selection method may create a survivorship bias in our sample of firms.

⁷The figures are based on data taken from the *Prowess* database, and not from survey responses, consistent with our strategy of relying on *Prowess* for financial information.

A final set of problems may affect the output of the survey, including the nature and size of the sample of firms surveyed. Conceivably, the final sample of 141 firms used in the present study could suffer from two potential biases, affecting the statistical results based on the sample. First, the sample may not be representative of the population it is drawn from, namely the population of similar firms in *Prowess* database. To verify this, for year 2005 (the last year before the survey was conducted), we conduct large sample mean difference tests between the sample firms and the 2,343 SMEs included in *Prowess*⁸ for important firm-specific variables, including total assets, sales, and trade credit received. The hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We do the same analysis for manufacturing and services firms separately, and again do not find significant statistical differences between the means except in one case where there is weak evidence of inequality (between mean sales for the sample firms in services and the corresponding population mean). We meant to extend this analysis to each industry represented in our final sample. However, the sample size in each industry is too small for the purpose.

Our sample is not a random sample, and includes firms that we were able to survey. To check whether the characteristics of the firms in our sample differ significantly from a randomly drawn sample, we carry out *non-parametric with-replacement* random sampling⁹ to generate 2,000 random samples, each of size 141, from the *Prowess* population of non-financial firms that satisfied our sample selection criteria (must have existed for at least five years in 2005). For the year 2005, we calculate the averages of the corresponding means and standard deviations of different firm-specific variables across the 2,000 random samples. For each variable, we conduct a mean-difference test between our sample firms and the average of the random samples. The hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We repeat the analysis for manufacturing and services firms separately, but the results do not change.

We conclude that the sample used in this study is free from non-representativeness and non-randomness biases. The details of the tests and results underlying this conclusion are reported in appendix at the end of this paper.

⁸ To smoothen the distribution, we exclude outliers from the *Prowess* population by winsorizing the top and the bottom 2.5% of the firms on the basis of total assets.

⁹ See M N Murthy, *Sampling Theory and Methods*, Statistical Publishing Society, 1967

D. Relationship Indices

Using the responses to a survey question about the importance of various informal channels to settle commercial disputes, we construct three indices, to be used as variables in our regression models indicating the degree of reliance on inter-firm relationships for contract enforcement

- Reliance on Relationships (*ROR*) index, based on responses to a question if the respondent firm relied on informal relationships to resolve disputes. The question mentions nine types of relationships, four of them arising from business and the other five from social interactions.
- Reliance on Business Relationships (*ROBR*) index, based on the four types of business relationships;
- Reliance on Social Relationships (*ROSR*) index, based on the five types of social interactions.

For each of the above indices, the respondents rated the relationships on a 1- 5 scale (1 = not important at all; 5 = extremely important). The index value is the average of the ranks of all the relationships listed in the question. Thus, the value of an index ranges from 1 to 5 for each respondent firm. Higher value of an index indicates greater reliability on the relationships (business or social) for settling disputes. Table 3A reports the questions as well as the mean responses for each question used in construction of the above indices.

[Table 3A here]

It is important to note that, in the context of our study, the difference between the business and social relationship variables derives from the *source* of the relationship (e.g. a relative as opposed to a business acquaintance) rather than the *consequence* of the relationship which is the same for both types of indices (e.g. settlement of business dispute).

Table 3B reports the summary statistics of the indices described above. On average, firms attach more importance to business relations than to social relations in negotiation with the suppliers/customers involving default or breach of contract.

[Table 3B here]

E. Relationship-based Trade Credit

The survey included two questions asking the firms to indicate the proportion of their total trade credit coming from and going to relational contracts. Both questions mention seven types of relationships, three of them arising from business and the other four from social interactions. Using this information for a given firm in our sample, and the information on trade credit it actually received and extended in a given year from *Prowess* data, we estimate the amount of relationship-based credit received and extended for the firm in that year. For each firm in the sample, we compute $TCR^{Relation}$ (trade credit received from other firms in relationships), $TCR^{Business}$ (trade credit received from business relationship-based sources), and TCR^{Social} (trade credit received from social relationship-based sources). Similarly, $TCX^{Relation}$ (trade credit extended to other firms in relationships), $TCX^{Business}$ (trade credit extended to business relationship-based customers), and TCX^{Social} (trade credit extended to social relationship-based customers). Table 3C reports the summary statistics of the relationship-based inter-firm credit received and extended.

[Table 3C here]

We draw the reader's attention to two items in particular. First, the median value of the proportion of relationship-based trade credit received and extended by a firm in our sample is 30% and 33% respectively, indicating that the average firm in our sample depends on relationships for about a third of its credit needs and credit sales. Second, for our sample firms, business relationships dominate social relationships.

IV. Informal Relationships and Contract Enforcement

A. Dispute Prevention

Trade credit extended typically takes the form of credit sales. The surveyed firms were questioned about the cases of customer default. Out of the 141 firms in our final sample, 29 experienced default. To investigate how reliance of trade credit providers on informal channels for contract enforcement influences default by the customers on trade credit contracts, we estimate the following generic equation:

$$D_i = \beta_0 + \beta_1 RCE_i + \beta_2 TCX_i^R + \mathbf{FC}_i \beta + \nu_i \quad \dots\dots (1)$$

In our tests, the dependent variable (D_i), default on trade credit contracts faced by firm i in our sample, changes depending on the type of credit: $D_i^{Relation}$ for relationship-based credit, $D_i^{Business}$ for business relationship-based credit, and D_i^{Social} for social relationship-based credit. In each form the variable is discontinuous, with a value between 0 and 1, reflecting the exposure of a firm in our sample to defaults by credit customers, and zero otherwise. The exposure is measured by the proportion of total credit extended to customers within relationships. For example, if the proportion is 40% for relationship-based credit, the dependent variable $D_i^{Relation}$ takes a value of 0.4. RCE_i represents reliance on relationships for contract enforcement indices. In other words, depending on the particular relationship, it is ROR , or $ROBR$ or $ROSR$. Similarly, TCX_i^R represents trade credit extended in relationships and, depending on the relationship, is $TCX^{Relation}$, or $TCX^{Business}$, or TCX^{Social} . The \mathbf{FC}_i vector includes a set of characteristics for firm i in the sample, including total assets, sales, firm age (scaled appropriately)¹⁰ and two control dummies: Industry (0=services, 1=manufacturing) and Listing (0 = unlisted, 1= listed).

Table 4 reports the results of our tests based on three *TOBIT* regression models with $D_i^{Relation}$, $D_i^{Business}$ and D_i^{Social} as the dependent variable. Note that the coefficients of the indices indicating reliance on relationships for contract enforcement – ROR , $ROBR$ and $ROSR$ – are positive in all three specifications, though none of them are statistically significant. If the informal channels were effective in lowering the probability of defaults on credit sales, the coefficients would be significantly negative. The results indicate that the informal channels are not effective.

[Table 4 here]

The coefficients for variables indicating trade credit extended to relationship-based customers, $TCX^{Relation}$, $TCX^{Business}$ and TCX^{Social} , are positive and significant. The results uniformly indicate that default probability increases in relationship-based credit. For example, the reported coefficient of $TCX^{Relation}$ in the table, 1.648, corresponds to an increase in default probability of as much as 0.09 for the median firm in our sample.

¹⁰ We scale Sales as $\text{Log}(1+\text{Total Sales})$, Total Assets as $\text{Log}(\text{Total Assets})$ and Firm age as $\text{Log}(1+\text{Age})$.

Normally, firm characteristics such as size, sales, and age are supposed to proxy firm quality. Customer firms presumably will be less inclined to default against high-quality firms; the on-going relationships could be more valuable in such cases. We see no evidence of this in the results, except for sales which has a significantly negative effect on default probability.

We investigate the possibility that the above results for default within relationships could be biased due to an endogeneity problem in the regression model. The firms with greater exposure to default on relationship-based credit may rely more on relationships for enforcement of relational contracts. In other words, the reliance on relationships for contract enforcement variables, ROR , $ROBR$, and $ROSR$, could be influenced by the dependent variables, $D_i^{Relation}$, $D_i^{Business}$ and D_i^{Social} respectively, resulting in a reverse causation problem. To address this issue, we estimate the RCE_i variables using the following generic equation:

$$RCE_i = \beta'_0 + \beta'_1 D_i + \beta'_2 TCR_i^R + \mathbf{FC}_i \beta' + \nu'_i \quad \dots\dots (1')$$

As in equation (1), the dependent variable in (1') changes depending on the type of the credit. In regression model (1'), TCR_i^R represents, depending on the test, $TCR^{Relation}$ or $TCR^{Business}$ or TCR^{Social} . TCR_i^R is used in (1') in place of TCX_i^R for exact identification of equation (1) and equation (1'). The results for equation (1') are not reported, because the Wald test statistic and the corresponding p -value in each of the three tests of equation (1') suggest that the two equations, (1) and (1'), are exogenous. However, the test statistics are reported in Table 4.

B. Dispute Settlement

As we have noted above, out of the 141 firms in our final sample, 29 experienced default by customers of credit sales. Among the 29 firms, only 2 relied on courts to resolve the disputes; the others used informal channels or did not contemplate any action.

To proceed further, we are required to address two methodological issues. First, since the 29 firms that faced customer default do not constitute a random sample, standard regression analysis based on this sample may yield biased estimates. Therefore, we use two – stage

Heckman procedure¹¹ to correct for selection bias. The selection stage involves predicting customer default on all 141 firms in our sample¹².

Second, since the number of observations is only 29, the parameter estimates from logistic regressions may not be reliable. Therefore, we use *with-replacement* nonparametric bootstrapping to generate samples of size 29 using the original data¹³.

Our test model is the following equation:

$$ROL_i = \beta_0 + \beta_1 RCE_i + \mathbf{FC}_i \beta + \sigma \hat{\lambda}_i + \epsilon_i, \quad i = 1, 2, \dots, 29 \quad \dots (2)$$

The dependent variable, Reliance on Law (ROL_i), is a categorical variable such that it takes a value of 1 if the firm relies on the court to redress customer default, and zero otherwise. RCE_i variable is the same as in regression model (1). \mathbf{FC}_i vector includes characteristic variables for firm i , including sales, total assets and age of the firm¹⁴. Note that regression equation (2) represents the outcome stage in two-stage Heckman model and includes estimate of λ_i Heckman correction for selection bias.

Since ROL_i is a categorical variable, we perform logistic regression. As discussed before, we use *with-replacement* nonparametric bootstrapping. The method permits estimating the sampling distribution of a statistic empirically without making assumptions about the distribution of the population, and without deriving the sampling distribution explicitly. We use random- x re-sampling to select 2,000 bootstrap samples¹⁵ from the possible set of size 29²⁹. We fit the model for each sample and note the regression coefficients. We compute the average of these coefficients and their variance. We repeat the bootstrapping process 20 times.

Table 5 presents the results of four tests based on regression equation (2), including the ranges for the t -statistics and regression coefficients. In each test, ROL_i is the dependent variable. In column 1 of the table, reliance on relationship, ROR , is the sole independent variable. In column 2 we include control variables sales, assets, and age, all of them appropriately scaled.

¹¹ Heckman, J., 'Sample Selection Bias as a Specification Error', *Econometrica*, Vol. 47, No. 1. (Jan., 1979), pp. 153-161

¹² The regression results for the selection stage are not reported in the paper, but are available on request.

¹³ See *An Introduction to the Bootstrap (Monographs on Statistics and Applied Probability)* by Bradley Efron and R.J. Tibshirani

¹⁴ \mathbf{FC}_i does not include listing and industry dummies, because they were insignificant in equation (1).

¹⁵ Usually 500 to 1000 bootstrap samples are enough for robust estimates of regression coefficients. But we were interested in bootstrapping logistic regression therefore preferred to use more re-samples.

[Table 5 here]

The most striking result that emerges from the test results is the strong negative association between reliance on law and reliance on relationships for contract enforcement. In both models, the coefficient of *ROR* is consistently and strongly negative (at 1% level). For example, in model 2 which includes the control variables, the coefficient of *ROR* ranges from -0.73 to -0.47. The range corresponds to a decrease in the probability of seeking legal sanction in the range 0.01 - 0.11 for the median firm in the set of the 29 firms in our sample that faced default. The results clearly reject complementary association between courts and informal channels of dispute resolution.

The control variables indicate that firms with larger sales and older firms are more inclined to use the courts than the others. In all models, the coefficients of sales and age variables are strongly positive (at 1% level). Note that firms that sell more have more to lose when their customers default. Further, age and sales variables are proxy for firm quality and reputation. The results suggest that firms that have more to lose, either by way of reputation or lost sales, are less enthusiastic about using relationships to resolve commercial disputes. Informal channels are more appealing for smaller and younger firms. This implication appears to be contradicted by the coefficient of total assets (strongly negative). However, the link between the size of total assets and trade credit extended is not obvious, unlike the link between sales and trade credit. In other words, the size of total assets as a control variable is not very meaningful.

As indicated above, all parameter estimates in the models are corrected for selection bias following Heckman procedure described above. Note that the coefficient of λ is significant in all models, though the sign is inconsistent across models. The results indicate that it was important to have used the Heckman procedure.

Are the above results robust to using partitions of the aggregate relationships, such as business relationships and social relationships, as independent variables in our tests? The test results reported in columns 3 and 4 in table 5, present the results of this exercise. Note that all our results remain unchanged. In both columns, the coefficients of *ROBR* and *ROSR* are strongly negative (at 1% level). The coefficients of sales and age variables are also strongly negative as before.

V. Conclusions

The empirical findings in the present study do not support the effectiveness of informal channels for contract enforcement. Availability of informal channels, whether a business connection or a social relationship, does not prevent customer defaults; more credit sales actually make them more likely. We have noted above that the median firm in our sample depends on relationship-based credit for only a third of the trade credit it receives. In other words, it can conceivably default on a relational contract for goods received from a partner firm in relational contract, and seek alternative partners. As we have observed in the introduction, given the fairly developed market institutions in India, the search cost of locating alternative partners is limited and the repeated-game incentives to continue the current relationships are weak.

Interestingly, we have also found that following a default many firms, especially the smaller and younger firms, prefer to rely on relationship-based channels to settle the dispute rather than seek redress in the court. We have presented a direct test where the firms faced with a breach of contract by customers/suppliers had the choice of going to the court or working the informal channels. The finding suggests substitution of informal relationships for legal institutions among the smaller firms in India.

We should note that the two results noted above appear inconsistent at the first glance. If non-legal channels do not reduce default probability, should the suppliers faced with a default prefer this method over legal recourse? Conceivably, even though informal channels are not effective in preventing contract violations, seeking redress through them following a violation entails less transactions costs than through an ineffective legal system. As we have noted section II of this paper, legal protection of creditor rights in India, as in many emerging countries, is poor in practice. Faced with a choice, the firms choose the lesser of the two evils, even though it is not a wholly satisfactory choice.

In their study on dispute prevention without courts in Vietnam, McMillan and Woodruff (1999b) make the following insightful observation: “As market information improves in Vietnam, the need for workable laws of contract and courts able to enforce them will become more pressing”. India today has workable market institutions and elaborate contract laws on paper but, unfortunately, an ineffective court system. Our findings call for stronger legal institutions and stricter enforcement of contracts.

Appendix

1. **Test for Representativeness:** In our case, out of the 2343 non-financial SMEs in the *Prowess* database for which financial information was available for at least last five years when the survey was conducted, 141 firms responded to the survey. Given that the sample firms account approximately 6% of the population, it is important to ensure that they are representative of the *Prowess* SME population. To verify this, for year 2005 (the last year before the survey was conducted), we conduct large sample mean difference tests between the sample firms and the *Prowess* SME population for important firm-specific variables, including total assets, sales and trade credit received. As the table below indicates, the hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We do the same analysis for manufacturing and services firms separately, and again do not find significant statistical differences between the means except in one case where there is weak evidence of inequality (between mean sales for the sample firms in services and the corresponding population mean). We meant to extend this analysis to each industry represented in our final sample. However, the sample size in each industry is too small for the purpose.
2. **Test for Randomness:** Our sample is not a random sample, and includes firms that we were able to survey. To check whether the characteristics of the firms in our sample differ significantly from a randomly drawn sample, we carry out *non-parametric with-replacement* random sampling to generate 2,000 random samples, each of size 141, from the *Prowess* SME population. For the year 2005, we calculate the averages of the corresponding means and standard deviations of different firm-specific variables across the 2,000 random samples. For each variable, we conduct a mean-difference test between our sample firms and the average of the random samples. As the table below indicates, the hypothesis that the corresponding means are statistically different is strongly rejected in all cases. We repeat the analysis for manufacturing and services firms separately, but the results do not change.

		Sample	<i>Prowess</i>	Simulated	<i>p</i> -values	<i>p</i> -values
		Firms (1)	Population	Sample from	(1)-(2)	(1)-(3)
			(2)	<i>Prowess</i> (3)		
No. of Firms	<i>All</i>	141	2343	141	N/A	N/A
	<i>Manufacturing (in %)</i>	66.7	64.5	66.7	0.66	0.5
	<i>Services (in %)</i>	33.3	35.5	33.3	0.38	0.5
<i>Firm Characteristics (in Mn.\$)</i>						
Total Assets	<i>All</i>	5.31 (6.9)	6.27 (10.2)	6.23 (9.8)	0.36	0.53
	<i>Manufacturing</i>	4.23 (3.5)	5.0 (6.87)	4.98 (6.53)	0.31	0.51
	<i>Services</i>	7.5 (10.6)	10.0 (20.9)	9.9 (19.03)	0.15	0.46
Total Sales	<i>All</i>	6.91 (10.4)	7.61 (20.8)	7.56 (18.8)	0.60	0.77
	<i>Manufacturing</i>	6.75 (7.7)	6.02 (11.5)	5.95 (10.4)	0.55	0.66
	<i>Services</i>	7.23 (14.58)	13.28 (63.6)	13.3 (41)	0.06	0.34
Trade Credit Received	<i>All</i>	1.53 (3.4)	1.0 (2.6)	1.0 (2.44)	0.33	0.38
	<i>Manufacturing</i>	1.05 (1.52)	0.88 (1.84)	0.88 (1.65)	0.51	0.61
	<i>Services</i>	2.53 (5.55)	1.21 (3.61)	1.2 (3.05)	0.19	0.3

(The table reports the means of different firm characteristics and values in parentheses are standard deviations)

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Table 1 Law and Institutions in India and Other countries

This table compares legal systems and institutions related to investor protection in India, LLSV country-groups (sorted by legal origins) and other large emerging economies. Notation (E), (F), or (G) against a country indicates that the said country belongs to English, French, or German legal origin groups. Creditor rights scores are from DMS (2007) and Anti-director rights scores are from DLLS (2008). Corruption Perception Index values, from Transparency International (2006), are based on the surveys of firms on whether corruption is prevalent when conducting business in each country and ranges from 0 to 10, with 0 meaning most corrupt and 10 meaning least corrupt. Legal Formalism Index, from DLLS (2003), measures substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts; the index ranges from 0 to 7, where a higher score means greater formalism or a higher level of intervention in the judicial process. Legality Index, from Berkowitz, Pistor, and Richard (2003), uses five legality proxies (each range from 0 to ten) from LLSV(1997, 1998) and principal components analysis to aggregate the individual legality proxies into a single legality Index; the index ranges from 0 to 21 with a higher score meaning a better legal environment.

	Creditor Rights	Anti-Director Rights	Legal Formalism Index	Legality Index	Corruption Perception Index
India (E)	2	5	3.51	11.35	3.3
English-origin Ave.	2.28	4.19	3.02	15.56	5.33
French-origin Ave.	1.31	2.91	4.38	13.11	4.39
German-origin Ave.	2.33	3.04	3.57	15.53	5.58
Nordic-origin Ave.	1.75	3.80	3.32	16.42	9.34
Sample Ave.	1.8 ^a	3.37 ^b	3.58 ^c	14.98	5.24
Argentina (F)	1	2	5.49	10.31	2.9
Brazil (F)	1	5	3.83	11.43	3.3
China	2	1	3.4	N/a	3.3
Egypt (F)	2	3	3.6	10.14	3.3
Indonesia (F)	2	4	3.88	8.37	2.4
Korea (South)(G)	3	4.5	3.33	12.24	5.1
Malaysia (E)	3	5	3.21	13.82	5
Mexico (F)	0	3	4.82	10.79	3.3
Pakistan (E)	1	4	3.74	8.27	2.2
Peru (F)	0	3.5	5.42	9.13	3.3
Philippines (F)	1	4	5	7.91	2.5
S. Africa (E)	3	5	3.68	11.95	4.6
Sri Lanka (E)	2	4	3.89	9.68	3.1
Taiwan (G)	2	3	3.04	14.26	5.9
Thailand (E)	2	4	4.25	10.7	3.6
Turkey (F)	2	3	3.49	9.88	3.8
Average of EMs	1.69	3.63	4.00	10.59	3.60

Notes: ^a: DMS (2007) average; ^b: DLLS (2007) average; ^c: DLLS (2003) average;

Table 2A: Summary of Survey Data

The table reports summary of survey responses by the 141 firms in our sample on location, industry, listing information, age, etc., with classification on the basis of number of employees. The survey was conducted in year 2006. The respondents were either owners or top executives of the surveyed firms.

	All	Number of Employees			
		0-50	50-100	100-200	200 and above
No. of Firms	141	36	34	33	38
(in %)		25.5	24.1	23.4	27.0
Location					
Northern India (in %)	18.4	16.7	14.7	12.1	28.9
Eastern India (in %)	9.9	2.8	14.7	21.2	2.6
Western India (in %)	30.5	33.3	17.6	42.4	28.9
Southern India (in %)	41.1	47.2	52.9	24.2	39.5
Industry					
Manufacturing (in %)	66.7	63.9	67.6	63.6	71.1
Services (in %)	33.3	36.1	32.4	36.4	28.9
Listing Information					
Yes (in %)	75.2	77.8	67.6	78.8	76.3
No (in %)	24.8	22.2	32.4	21.2	23.7
Age (in Years)					
0-10 (in %)	7.1	5.6	5.9	9.1	7.9
10-20 (in %)	53.2	69.4	44.1	45.5	52.6
20 & above (in %)	39.7	25.0	50.0	45.5	39.5
Day-to-Day Management					
Owner/Partner (in %)	62.9	52.8	69.7	66.7	63.2
Hired Manager (in %)	37.1	47.2	30.3	33.3	36.8
Top Manager belonging to Founding Family					
Yes (in %)	66.7	61.1	68.8	62.5	73.7
No (in %)	33.3	38.9	31.3	37.5	26.3
Cases of Customer Default on Trade Credit					
Yes (in %)	20.6	13.9	32.4	36.4	2.6
No (in %)	79.4	86.1	67.6	63.6	97.4

Table 2B: Summary Statistics of Firm Characteristics (in Mn. \$)

The table reports summary statistics for firm characteristic variables that we have used in regression models. All the statistics reported below are based cross section of surveyed firms (141) for year 2005.

Variables	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
Total Assets	141	0.13	5.31	3.44	46.31	6.89
Total Sales	141	0.00	6.91	2.85	76.28	10.42
Trade Credit Extended	141	0.00	1.30	0.56	24.29	2.69
Trade Credit Received	141	0.00	1.53	0.47	23.77	3.47

Table 3A: Relationship Variables from Survey Responses

The table reports the mean response by the firms in our sample to survey question. The question is designed to gauge the importance a respondent attaches to informal relationships settling in disputes involving relational contracts. The question has nine sub-parts. For each firm, the responses to the first four parts are used in constructing *ROBR* index, while the responses to the remaining five parts are used in constructing the *ROSR* index. Responses to all nine parts are used in constructing *ROR* index. The survey was conducted in year 2006. The respondents were either owners or top executives of the surveyed firms.

Importance of the following in negotiations with suppliers/customers involving default or breach of contract (Scale: 1= not important to 5= extremely important)	Sample Mean		
Geographic proximity of the other party	3.1	Reliance on Business Relationships for Contract Enforcement	Reliance on Relationships for Contract Enforcement
Advocacy on behalf of other party by another business man in industry	3.2		
Met other party before in a professional setting	3.2		
Affiliation in common industry associations	3.7		
Other party related to you through extended family	2.6	Reliance on Social Relationships for Contract Enforcement	
Other party socially known to you	2.7		
Other party belongs to your caste	2.5		
Other party has same native language as yours	2.7		
Advocacy on behalf of other party by relative, friend or social contact	3.1		

Table 3B: Summary Statistics of Relationship Variables

The table reports summary statistics for relationship variables that we have created based on the responses to questions asked in survey. The survey was conducted by a professional survey company in year 2006 and respondents were either owners or top-executives.

Variables	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
<i>ROR</i>	130	1.00	2.99	2.90	4.40	0.77
<i>ROBR</i>	130	1.00	3.24	3.40	4.60	0.78
<i>ROSR</i>	130	1.00	2.74	2.60	4.20	0.90

Table 3C: Summary Statistics of Relationship Based Inter-Firm Credit

The table reports summary statistics of the variables indicating relationship based inter-firm credit received and extended by firms in our sample. Variables that we have created are based on the responses to questions asked in survey and financial information based on cross section of surveyed firms (141) for year 2005

Variables	No. of Obs.	Min	Mean	Median	Max	Standard Deviation
<i>TCR^{Relation}</i> (in Mn. \$)	137	0.00	0.71	0.13	21.20	2.26
<i>TCR^{Business}</i> (in Mn. \$)	137	0.00	0.70	0.13	16.86	2.21
<i>TCR^{Social}</i> (in Mn. \$)	124	0.00	0.71	0.12	23.77	2.37
<i>TCX^{Relation}</i> (in Mn. \$)	137	0.00	0.67	0.18	21.66	2.11
<i>TCX^{Business}</i> (in Mn. \$)	137	0.00	0.70	0.19	24.29	2.33
<i>TCX^{Social}</i> (in Mn. \$)	137	0.00	0.53	0.12	16.19	1.63

Table 4: Informal Relationships and Contract Enforcement – Dispute Prevention

The table reports *TOBIT* regression results of the following generic equation:

$$D_i = \beta_0 + \beta_1 RCE_i + \beta_2 TCX_i^R + \mathbf{FC}_i \beta + \nu_i \dots (1)$$

In our tests, the dependent variable (D_i), default on trade credit contracts faced by firm i in our sample, changes depending on the type of credit: $D_i^{Relation}$ for relationship-based credit, $D_i^{Business}$ for business relationship-based credit, and D_i^{Social} for social relationship-based credit. It is a discontinuous variable, with a value between 0 and 1 reflecting the exposure of a firm in our sample to defaults by relationship-based customers, and zero otherwise. RCE_i represents reliance on relationships for contract enforcement indices. In other words, depending on the particular relationship, it is ROR , or $ROBR$ or $ROSR$. Similarly, TCX_i^R represents trade credit extended in relationships and, depending on the relationship, is $TCX^{Relation}$, or $TCX^{Business}$, or TCX^{Social} . The \mathbf{FC}_i vector includes a set of characteristics for firm i in the sample, including total assets, sales, firm age and two control dummies: Industry and Listing. All regressions are with constant, coefficient not reported. Standard errors are reported in brackets.

To address the issue of endogeneity/ simultaneity we predict RCE_i variables using following regression model:

$$RCE_i = \beta'_0 + \beta'_1 D_i + \beta'_2 TCR_i^R + \mathbf{FC}_i \beta' + \nu'_i \dots (1')$$

TCR_i^R represents, depending on the test, $TCR^{Relation}$ or $TCR^{Business}$ or TCR^{Social} . TCR_i^R is used in (1') in place of TCX_i^R for exact identification of equation (1) and equation (1'). The Wald test statistic and p -value for exogeneity of the equation reported. The results for the equation (1') are not reported, because the Wald test statistic and the corresponding p -value in each of the three tests of equation (1') suggest that the two equations, (1) and (1'), are exogenous.

	$D_i^{Relation}$	$D_i^{Business}$	D_i^{Social}
<i>Reliance on Informal Relationships for Contract Enforcement</i>			
ROR	0.13 [1.03]		
ROBR		0.17 [1.42]	
ROSR			0.06 [0.62]
<i>Trade Credit Extended in Informal Relationships</i>			
TCX^{Relation}	1.65** [2.08]		
TCX^{Business}		1.69** [2.48]	
TCX^{Social}			1.61* [1.94]
<i>Firm Characteristics</i>			
TOTAL ASSETS^a	0.18 [1.40]	0.18 [1.42]	0.15 [1.13]
SALES^a	-0.24** [-2.17]	-0.25** [-2.32]	-0.20** [-2.05]
AGE^a	0.01 [0.02]	-0.02 [-0.09]	0.01 [0.92]
LISTING DUMMY^b	-0.12 [-0.51]	-0.16 [-0.69]	-0.09 [-0.43]
INDUSTRY DUMMY^c	0.10 [0.54]	0.10 [0.51]	0.08 [0.48]
Observations	128	128	128
Wald Statistics for Exogeneity of equations	0.16	0.1	0.1
p -value	0.69	0.75	0.75

*: significant at 10%; **: significant at 5%; ***: significant at 1%; ^a: Here we have used Log (1+Total Sales), Log (Total Assets) and Log (1+ Age), ^b: 1=Listed and 0= Unlisted, ^c: 1:=Manufacturing and 0= Services

Table 5: Informal Relationships and Contract Enforcement – Dispute Settlement

The table reports *LOGIT* regression results of the following generic equation:

$$ROL_i = \beta_0 + \beta_1 RCE_i + \mathbf{FC}_i \beta + \sigma \hat{\lambda}_i + \epsilon_i \quad \dots (2)$$

The dependent variable is a categorical variable – Reliance on Law (*ROL*) taking value 1 for the firms who relied on courts for settling disputes in case of customer(s) default, and zero otherwise. *RCE_i* variable is the same as in regression equation (1). *FC_i* vector includes characteristic variables for firm *i*, including sales, total assets and age of the firm. We have used logistic regression to analyze the importance of informal relationships in resolving disputes vis-à-vis courts. This is the outcome stage of the Heckman model. The selection stage involves predicting customer default. Due to small sample size we use random-*x* re-sampling to select 2,000 bootstrap samples and fit the model for each sample and note the regression coefficients. We compute the average of these coefficients and their variance. We repeat the bootstrapping process 20 times and range for coefficients and deviance are reported below. All regressions were with constant, coefficient not reported. Range for *t*-statistics reported in brackets

	1	2	3	4
<i>Reliance on Informal Relationships for Contract Enforcement</i>				
ROR	-1.02 to -0.63 *** [-8.49 to -6.41]	-0.73 to -0.47 *** [-11.27 to -7.44]		
ROBR			-0.54 to -0.37*** [-12.35 to -9.45]	-0.56 to -0.43*** [-13.41 to -10.4]
ROSR			-0.54 to -0.36*** [-11.28 to -7.82]	-0.27 to -0.18*** [-8.66 to -4.99]
<i>Firm Characteristics</i>				
SALES^a		0.23 to 0.30 *** [12.49 to 15.66]		0.18 to 0.24*** [9.94 to 13.44]
TOTAL ASSETS^a		-0.28 to -0.20 *** [-11.35 to -8.18]		-0.16 to -0.11*** [-8.13 to -5.35]
AGE^a		0.51 to 0.59 *** [13.1 to 16.53]		0.56 to 0.65*** [17.79 to 22.52]
Lambda hat ($\hat{\lambda}$)	0.15 to 0.95 ** [0.64 to 4.69]	-0.70 to -0.15 ** [-3.95 to -0.86]	0.44 to 1.17* [2.45 to 7.95]	-0.63 to -0.18** [-4.06 to -1.08]
Deviance	11.61 to 11.97	9.69 to 10.17	10.15 to 10.49	9.21 to 9.44
No. of Observations	Range for parameter estimates being reported for 20 different sets of 2000 samples			

*: significant at 10%; **: significant at 5%; ***: significant at 1%; ^a: Here we have used Log (1+Total Sales), Log (Total Assets) and Log (1+ Age).